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**SAMPEX**

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Project Mgr: G. Colon  
MOM: J. Catena  
LV/Range: Scout/VAFB

Launch Date: June 1992

Projected SC Life/DSN Support: Prime mission 3 years plus 3 years extended mission/two 15 minute contacts per day, and backup to Wallops for high rate telemetry data dump.

Project Responsibility: Goddard Space Flight Center (GSFC)

Source: SIRD  
Sponsor: OSO

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**A. MISSION DESCRIPTION**

GSFC developed the SMEX program, managed by the Special Payloads Division (SPD) (Code 740), to provide frequent flight opportunities for highly focused and inexpensive space science missions. SMEX was conceived as a low-cost program with a short turnaround (3 years) from mission selection until launch. SAMPEX is the first mission of the SMEX program. Its primary scientific objectives are to measure the elemental and isotopic composition of solar energetic particles, anomalous cosmic rays, and galactic cosmic rays over the energy range from approximately 1 to several hundred MeV per nucleon. By determining the dependence of the fluxes on geomagnetic cutoff rigidity over the polar orbit, the ionization state of the anomalous component will be determined, along with the mean ionization state of solar energetic particles. The dependence of these fluxes on the solar activity cycle will be measured by carrying out continuous observations over an extended (3-year) portion of the current activity cycle. A further primary objective is to

determine flux levels and local time dependence of relativistic precipitating magnetospheric electrons during a period of declining solar activity.

## B. FLIGHT PROFILE

SAMPEX will be launched June 1992, using a four-stage Scout launch vehicle into a nominal elliptical orbit of 450 by 850 kilometers with an inclination of 82 degrees (not Sun-synchronous) from VAFB. There is no transfer orbit for the SAMPEX spacecraft.

Using this Scout configuration, the uncertainty in achieving the perigee and apogee are as follows for a (TBS) percent probability.

1. Period = 98 minutes
2. Contact time = 8 - 16 minutes

## C. COVERAGE

1. Coverage Goals

DSN will support two contacts per day (12 hours apart), low rate TLM, command, and RMD. Provide backup support to Wallops for high rate TLM dumps.

2. Network Support

The support provided by the DSN is indicated in the following table:

<u>System</u>	<u>Goldstone</u>					<u>Canberra</u>					<u>Madrid</u>		
	12	14	15	16	17	42	43	45	46		61	63	66
S-band TLM				P	B				P			P	
S-band CMD				P	B				P			P	
S-band TRK				P	B				P			P	

NOTE: P = Prime  
B = Back-up

3. Compatibility Testing

Scheduled for August 15, 1991.

## D. FREQUENCY ASSIGNMENTS

Frequencies are allocated according to the following table:

<u>System</u>	<u>Uplink (MHz)</u>	<u>Downlink (MHz)</u>	<u>Polarization</u>
S-band TLM		2215.0	LCP
S-band CMD	2.039.65		LCP
S-band TRK		2215.0	LCP

## E. SUPPORT PARAMETERS

The support parameters for the Telemetry, Command, and Support Systems are listed below:

## (1) Telemetry

Data Streams	3
Format	PCM/NRZ-L/CONVL K=7, R=1/2/BiØ-L/PM
Subcarrier	None (Directly on Carrier)
Bit Rates	4, 16, and 900 kb/s
Record	Digital

## (2) Command

Format	PCM/NRZ-L/PSK/PM
Bit Rate	2.0 kb/s
Subcarrier Frequency	16 kHz/s

## (3) Support

Uplink Power	2 kW Nominal
Antenna Rate	Moderate
Antenna Angle Data	Required
Antenna Autotrack	Required
Doppler Rates	
Range Format	Tone (Sine)

Recording  
 . Digital

## F. TRACKING SUPPORT RESPONSIBILITY

The allocation of responsibilities for tracking support is listed in the following table:

<u>Mission Phase</u>	<u>Support Responsibility</u>
Launch	GSFC
Mission	DSN
Emergency	DSN

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